Synopsis on

Assessment of impact of Industrial effluents on Groundwater Quality and Soil Quality index in MIDC area Krushnoor, District Nanded, Maharashtra , India.

Submitted to

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Abstract

Due to modernisation the anthropogenic activities increases day by day. From the beginning of industrialization the peoples moves towards urban cities and thus urbanisation rapidly increases. It leads to more pressure on Natural resources. More population needs more resources of food, water, shelters. And it adversely effects on environment. Industrialization is main cause of soil and water pollution after agriculture practices and sewage water, these effluents directly discharges in open water bodies and land, leads to contaminate soil as well as ground water. This is the serious problem now a days. Thus the analysis of the water quality is very important to preserve and protect the natural eco system. The assessment of the ground water quality and soil quality is important in some villages near MIDC area Krushnoor. Because local villagers suffering the health problems from many years. Proper Soil samples and ground water samples will collected from study area which covers most of the affected area. And the observed data will compare with (WHO) and Indian Standard Drinking Water specification IS: 10500-2012.

INTRODUCTION

Soil and ground water has their significant role in nature to survive all the living things on the planet Earth. Soil Pollution is caused by addition of some chemicals which reduces the capacity of productivity. In rural areas more of fertilizers and pesticides are used in agricultural practices and the remaining chemicals drained and settle down on top layers of soil. From the beginning of Industrialization and urbanisation discharge of waste water and Industrial effluents with or without proper treatment which get mix in open water bodies, and deposited on soil are source of soil pollution. And most of the industries directly release the effluent on land which might be percolates through soil and contaminate ground water bodies. Unlike surface water pollution, ground water pollution is difficult to detect and control which can causes the problem to persist for long periods of time.

Soil pollution could lead to impact on crop productivity and human health. Investigating the sources, fate and occurrence of soil pollution, and risk posed to human health has thus been an important area of research **Jorge Paz-Ferreiro et Al,. (2018)**

Textileindustries consume a large quantity of water and generate a huge amount of wastewater, which are generally discharged into a common effluent drain of industrial area. Contaminated ground water has deteriorated the drinking water and impacts on soil systems and crop productivity. **Pawan K. Bharti et Al,.(2013)**

Some industrial effluent on the basis of sources, types and constituents, when applied to soil environment in the form of irrigation the contaminants assimilation is above the capacity of the soil system, some agricultural waste also leading to eutrophication of water bodies and ground water quality degradation. Sometime Industrial waste waters directly discharged in to river, lake or open water bodies and created new pollution problem. Industrial pollution is found in large amount in some industrial areas like Kanpur, Alahabad in UP, Surat in GJ. The data collected by various agencies like **CPCB, Greenpeace Research Laboratories, and Center for Science and Environment (CSE)**denotes that, in these area the quality of ground water and surface soil deteriorated. Therefore the focus of the research is to analyse physico-chemical characteristics of ground water and Soil near the MIDC area of Krushnoor. The pollution level of each effluent will be compare with the guidelines as prescribed by WHO and Indian Standard Institution.

Materials and methodology

Required soil samples will be collected from different fields of villages near by industrial area of Krushnoor. Soil samples will collected to the depth of about 0 to 15 cm from the surface, and store in well label polythene bags and transported to laboratory of research centre. Ground water samples will also be collect from handpumps, tube wells and pack in plastic bottles. These plastic bottles will store in dark region in laboratory to avoid errors in desired data. Global positioning system (GPS) will use to record the location coordinates of the sampling sites and preparation of base maps thematic maps. The pH and electrical conductivity (EC) will measure in situ by using portable digital meter. The gravimetric method will used for the analysis of Ca, Mg ,CO_3, HCO_3 and CI by following standard procedures of American public Health Association (APHA, 2005). The Na and K ions will analyse using flame photometer and Sulphate and Nitrateswill determine using spectrophotometer. Heavy metals contents in Soil will determine by analytical methods with sophisticated instruments like atomic absorption spectrophotometer. primary interpretive tool Arc GIS will use for generation of spatiotemporal maps. Different software's will use for statistical analysis like SPSS and R programming.

REVIEW OF LITERATURE

A GEETHA et Al.(2008) Assessment of Underground Water Contamination and Effect of Textile Effluents on Noyyal River Basin In and Around Tiruppur Town, Tamilnadu. In their study it was found that because of soil porosity, permeability and also the rocks nature the ground water quality was contaminated easily due to the industrial discharge of the effluents on to the river or land from the town.

Shashi Prabha et Al.,(2013) Impact assessment of textile effluent on groundwater quality in the vicinity of Tirupur industrial area, southern India. In their study they observed that The groundwater is highly alkaline in nature at some towns due to textile effluent percolation. dominance of Na–Cl type of water is mainly due to the impact of salts like NaCl, Na2SO4, etc. used in textile processing, which after percolate in soil and contaminate to ground water aquifers.

Islam M.O. et Al,. (2006) Impacts of industrial effluents on plant growth and soil properties. In this study they found that the contaminated soil affects the quality of crops. The contents of N, P and K in the rice plants grown on the contaminated soil decreased by 28, 32 and 65%, respectively. And the content of S and Na is increased by near about 1000 percent.

Sacchidananda Mukherjee et Al.,(2006) Groundwater pollution and emerging environmental challenges of industrial effluent irrigation in Mettupalayam Taluk, Tamil Nadu. The study shows that disposal of industrial effluent on land or continues irrigation of polluted water on soil which has limited capacity to assimilate with contaminants has leads to ground water pollution. And with the continuous irrigation of polluted effluent has resulted in increased salt content of soils, also the borewells water becomes salted. To face this challenge the farmer should change the crop which is tolerate salt content.

STUDY AREA

Krushnoor MIDC is located in Nanded district in Marathwada region of Maharashtra. Nanded is also the second largest city in Marathwada region of Maharashtra. A large number of its surrounding population is engaged in agricultural activities. Industrialisation in the district is yet to be progressed to a satisfactory level.

The MIDC of krushnoor has between **18.952461**^{0}North latitude and **77.493668**^{0} East longitude. The district has a geographical area of 10528 Sq. Kms.

Mean sea level of Nanded city is 489 metres altitude.

Industrially, the Nanded district is still a backward. As per the 1993 Package Scheme of Incentives of Maharashtra, the Talukas of Nanded are categorises under Group D or D plus.

National Highway passes near to the MIDC Krushnoor i.e., NH 161A Akot (MH) to Bidar(KA).

Most of the rural part is affected by industrial air pollution as well as water pollution.

So this study will cover the entire rural and city area which is affected by the Industrial pollution.

Objectives

- To collection the agricultural soil samples and ground water samples from the study area to analyse physico-chemical parameters.
- To use different sophisticated analytical techniques for analysis of soil and ground water parameters to get accurate data and information.
- To assess the effects of industrial effluents on Physico-chemical properties of agricultural soil of villages surrounding to the MIDC area.
- To find out the causes of ground water contaminants of villages near to the MIDC Krushnoor area.
- Compare the observed data of the analysed soil and ground water parameter with recommended standard for compliance
- To mitigate the problem of soil pollution and fine out the solution of industrial waste to decrease ground water pollution with the help of local authority.

International status

Ground Water most ground water naturally of good quality, but due to anthropogenic interference poses contaminants and leads to deterioration of water bodies. Long-time sustainability is important in present situation and this will not be possible without groundwater planning and investments supported by strong institutions and an appropriate legislative framework. *Seeing the invisible, The World Bank* (2022)

Groundwater quality management underestimate until the world will not understand the importance of ground planning. This year, groundwater is finally in the spotlight as the theme of World Water Day 2022. "*Groundwater – Making the Invisible Visible*,". It indicates the need to draw a attention on the hidden ground water sources and its conservation and prevention of quality of under ground aquifers.

Soil importance Most of the International scientist describe soils as like the skin of the living world, vital but thin and fragile, and easily damaged by intensive farming, forest destruction, Industrial and agreecultural pollution and global heating. One fourth of all the animal species on Earth live under the soil surface and provide the nutrients for all food. Since the Industrial Revolution, about 135bn tonnes of soil has been lost from farmland, according to Prof Rattan Lal, the 2020 winner of the *World Food prize*. The main causes of deteriorate the soils are intensive agriculture, with excessive use of chemical fertilisers, pesticides and antibiotics killing soil organisms and leaving it prone to erosion.

National Status :

Rapid urbanization and industrialization in India has resulted in steep increase of generation of wastes. The main causes of Ground water pollution is in urban areas of India is industrial discharges and second over exploitation. In concern of soil quality as population increases rapidly leads to over demand of food. For the better crop yield requires healthy soil as well as adequate water sources. But because of over population in India the demand of food rapidly increases and for instant and more yield farmers apply more chemical fertilizers without proper management, it directly affects Soil quality, water contamination, death of essential microorganisms human health. Sikkim is become India's first organic state which apply 0% chemical fertilizer and entire agricultural fields become 100% organic and healthy for people and environment.

Work Plan

1) Findout the problems of people facing due to industrial activities by personal visit on field.
2) Study on work related to the field or subject which has been taken.
3) Geological mapping of the study area with the GIS software.
4) Collection of Ground Water samples and Soil samples from surrounding area of MIDC area with proper methods, on the basis of environmental and geomorphological factors.
5) Analysis of Ground water samples and soil samples in Research laboratory with proper methodology with the help of sophisticated instrumentation to get reliable data.
6) Compare with obtained data with (WHO), BIS-10500 :2012 to corelate with different variables.
7) Identify the impact of industrial discharge on soil health, impact on Human health as well as ground water quality.

Structure of research work

Time (month)	**Work**
0 – 6	Review of literature
07- 24	Two time sampling/ field work/Laboratory work
24- 36	Data interpretation/ Publication writing/ Thesis writing

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Signature **Signature**

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